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ABSTRACT

Projecting future school enrollments seems to be a relatively simple mathematical procedure using current population figures, birth rates, migration rates, and grade progression ratios. Resource allocations and education facilities planning are based on these projecticns. In most American cities, the political power of various interest groups negates the effectiveness of enrollment projecticns. This situation exists because (1) principals and teachers, anxious to improve their positions, compete among each other for scarce resources, and (2) external political forces from community groups, home and school associations, and citizen watchdcg committees place pressures on the school board and administration to alter priorities and to expand or curtail funding and staffing levels. To avoid inequities brought about by pressure groups, educational planners should rely on rigorous research methodology and management planning techniques. (RA)

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PROJECTING SCHOOL ENROLLMENTS: A RESEARCH OR POLITICAL PROCESS?

One of the functions in public school systems that is growing increasingly important is the projection of future school enrollments. Short-range projections, covering anywhere from one to five years, are required for budgeting purposes, teacher and staff allocation, and the development of busing programs. Long-range projections are essential to the development of a capital program and are an integral part of the Long-Range Development Plans now required by law in some states, including Pennsylvania. They are also essential for the long-range expenditure projections increasingly needed by financially troubled large city school systems, and have important implications for the whole manpower question in public education. These long-range projections commonly cover a ten to twenty-five year period, and take into account such factors as changing trends in birth rates, changing land use patterns, public and private development and redevelopment, migration, and trends in public vs. non-public school enrollments.

While both types of projections lend themselves to the use of differing research methodologies and statistical techniques, political forces frequently intrude to influence the results of each. This paper describes the projection techniques utilized by the research staff of the School District of Philadelphia in developing both long-range and short-range enrollment projections, and identifies those political forces, both internal and external, which operate to influence projection results.

Short-range Enrollment Projections

The School District of Philadelphia annually prepares a short-range projection of enrollment, by school and by grade, for the coming school year. Recently, a computerized technique has been developed for this purpose. The resulting projection is used both in allocating funds and in assigning teachers and staff to the schools. It should not be surprising that these two objectives are usually in conflict.

Historically, short-range enrollment projections for the Philadelphia Public Schools had been based on estimates developed by each school principal. These estimates, generated annually for the coming year, were then adjusted by administrative staff responsible for the operation of the schools and used in determining the number and kinds of teachers to be assigned to each school. Professionally trained research staff were never meaningfully involved, and reliance on scientifically sound methodology was preempted by intuitive judgment and personal negotiation over projected enrollments. Final figures, not surprisingly, often reflected the personal prestige and influence of individual principals, and the relative political clout of each school neighborhood.

Two years ago, in the fall of 1969, the School District's Division of Administrative and Survey Research developed a computerized technique for preparing these short-range enrollment projections. The Division had been responsible for preparation of the long-term projections for several years, and had on its staff professionally trained researchers experienced with forecasting methodologies. The impetus for this new approach originated in the increasingly important role short-range enrollment projections were beginning to play in the budget allocation process, and the growing concern in the community over rapidly expanding expenditures for education.

The School District of Philadelphia had undertaken to implement a Planning, Programming, Budgeting System (PPBS) in 1966. By 1969, PPBS had been developed to the point of budgeting for individual schools, an approach which was also consistent with the trend toward administrative decentralization and increasing accountability for managers of educational programs. As a consequence, short-range enrollment projections were essential not only for planning the assignment of teachers and other staff for the coming year, but also as an integral part of the process of developing a budget for each school.

The later role for enrollment projections was derived from the so-called "equity principle" of funding schools adopted for PPBS in Philadelphia. Essentially, this meant that the allocation of resources was based on the number and kinds of pupils enrolled in each school, and a complex formula of factors, allowances and allotments has been developed for this purpose. The intent was to eliminate, or at least reduce materially, the disparate political influences which in the past had resulted in differential allocation of resources, and substitute a more rational and justifiable method.

From a methodological point of view, the short-range projections, by school and by grade, now constitute the basic "factor" in determining the allocation of resources for individual schools. Grade progression ratios are applied to the current year's enrollment in grades 2 through 12, while kindergarten and first grade enrollments are estimated on the basis of recent trends. Adjustments are made for other entry grades (i.e., in middle, junior and senior high schools), and for special situations being influenced by racial change, new residential development or redevelopment, and possible changes in public and non-public enrollment patterns.

Even such an apparently simple process, however, is complicated by a variety of forces. First, the sheer magnitude of the system - which operates approximately 275 individual school facilities, and serves nearly 300,000 pupils spread over an area of 134 square miles - produces a substantial number of "special cases" which must be processed differently. Secondly, at the present time, over 50 percent of the schools are overcrowded and some 8,600 pupils are bused daily from their home schools to less crowded facilities. In addition, 34 existing facilities are of non-fire resistive construction, and many others are classed as portables and demountables - which were to have been used to relieve temporary overcrowding, but which have been in continued use for 15 years or more. Not unexpectedly, the availability of space in various sections of the City changes from year to year, and consequently busing patterns vary annually. This of course influences enrollment projections based on enrollment trends over previous years.

Moreover, in addition to these technical problems, both internal and external political forces operate to influence the final projection figures.

Internal conflicts arise between these offices responsible primarily for resource allocation and budget control, which are concerned with the finite and limited amount of funds available for distribution among the 275 schools, and those offices with responsibility for assigning teachers and professional staff in sufficient number and with appropriate certification at the different school levels. Moreover, individual school principals have a strong stake in the outcome of the projections for two reasons. Not only will the projected enrollment for their school determine the level of funding and the size of their staff in the coming year, but it will also affect their own salary schedules. In the Philadelphia Public Schools, principals' salary grades are divided into groups based on size of enrollment and other factors. In connection with the short-term enrollment projections for the 1971-72 school year, some five schools are likely to move from their existing size classification to the next lower one. The principals involved are genuinely concerned about the implications of this for a change in their own salary schedules.

This concern is in addition to the natural and understandable tendency among principals to favor estimates of higher enrollment, because they ultimately must provide for all the pupils who show up in the coming year regardless of the projected figure. While our allocation system is flexible enough to permit the switching of teachers in these cases - a requirement of our union contract with the teachers - we have not succeeded in developing the machinery necessary for shifting the supporting services that would normally have been provided in the original budget process.

In any case, the principals' position on projected enrollments has traditionally predominated in Philadelphia, and even served to supplant the first systematic and computerized research approach directed at this issue last year.

The result was a difference of some 3,000 pupils City-wide between the research-generated projection and the principal-focused projection, causing a major - and as yet unresolved - conflict over both the estimates themselves and the resulting teacher allotments between the School District and a prominent economic "watch-dog" organization. It seems clear that this conflict, hardly needed in times of financial crisis and slipping credibility with the community, could have been avoided if decision-making had been based on the research data which reduced estimating error in half over the traditional method.

Similarly, the teacher's union, which is concerned with maintaining full employment for its membership and protecting established work assignments, is vitally interested in the projection results. These, taken together, represent the internal forces that operate to influence the final enrollment figures which will be used in the preparation of the School District's operating budget that is ultimately adopted by the School Board.

In addition to the internal political forces, however, strong external political forces may also come into play. On the one hand, community groups and home and school associations (PTA's) are interested in the maintenance of adequate funding and staffing levels of the individual schools which serve their respective neighborhoods. On the other hand, the citizen "watch-dog" committees and agencies, such as the one already mentioned, closely scrutinize both the projections and the operating budget with a view toward reducing School District expenditures. These conflicting views and positions result in political pressures being brought to bear on the School Board and the administration in an attempt to alter priorities, or to expand or curtail funding and staffing levels. They also have a very real effect on the enrollment projection process itself.

Long-range Enrollment Projections

At the same time that short-range enrollment projections are playing an increasingly important role in educational planning, a growing number of large urban school districts have recognized the need for long-range enrollment

projections. This need is apparent even in communities where overall population growth is quite modest or perhaps non-existent. Plagued with an increasing number of old facilities - many of which are non-fire resistive, even more of which are poorly located to serve the present day distribution of population - administrators in major urban areas like Philadelphia are faced with difficult decisions regarding where, when, at what level, and at what size to build new facilities. Long-range enrollment projections provide an indication of the magnitude of the gap between available space in existing and planned school facilities and future enrollment levels, and identify specific areas where space needs will be greatest.

The School District of Philadelphia periodically prepares long-range enrollment projections covering periods of 15 to 20 years into the future. At present, the procedure employed is to estimate public school enrollment as one component of the projected total population for the City of Philadelphia. The population projection utilizes the cohort-ratio method, developed by the Delaware Valley Regional Planning Commission.[1/] This technique allocates the projected City-wide population to specific geographic sub-areas by means of "R-Values" (the ratio of the survival value of a cohort in a given sub-area to the survival value of the same cohort for the entire City). The "R-Values" reflect historical trends, and where specific interrupting influences are anticipated in a given area, "R-Values" from another sub-area which had experienced similar influences in the past are applied.

Once the estimate of total population is developed, the next step is to project the school age population as one component of the total. This is accomplished by applying age-race specific survival rates, migration factors and current birth trends. The final step, however, is considerably more complex for a City such as Philadelphia. This step involves the determination of public and non-public school enrollments, by grade group, for relatively small areas of the City. Because Philadelphia is served by two separate and distinct school systems, the

public school system which serves about 65 percent of all school age children, and the parochial school system of the Roman Catholic Archdiocese of Philadelphia, which serves around 32 percent of the school age children,[2/] it is necessary to apply race-specific enrollment rates to arrive at estimates of public school enrollment in various areas of the City. This is necessary because enrollment in the public school system is approximately 60 percent Black, while the parochial school system is approximately 90 percent white. Moreover, parochial enrollment is highly concentrated in a limited number of sections of the City. For purposes of planning and analysis, the City is divided into 21 school planning areas, which are aggregates of census tracts. Total population, school age population and public school enrollment are then projected, by race and by grade group, for each planning area.

While the methodology and computer procedures have proved satisfactory for developing projections of enrollment City-wide over a 15 to 20 year period, a host of variables intrude to reduce the accuracy of the projection at the level of the individual school planning area. Foremost among these are:

1) Differences in the rate of change in a given area (very sharp differences often occur due to a change in the racial composition of an area - especially where white families, many of whom may have sent their children to non-public schools, are replaced by non-white families whose children attend public schools;[3/]

2) Changes in proposed development plans or programs (e.g., in the early 1960's one of the largest urban renewal projects in the country was undertaken in Southwest Philadelphia - the development schedule for this project called for the production of 20,000 housing units by the end of the sixties, but by the Fall of 1970 only 6,000 units had been constructed and occupied); and

3) Changes in Federal and State transportation and development projects (e.g., in the comprehensive transportation plan for the City of Philadelphia a cross-town expressway was proposed; this route cut a swath several blocks wide through South Philadelphia and would have dislocated several hundred families; the plans called for the design, relocation and construction phases of the project to be completed by 1970 - after considerable debate and disagreement among the City, State and Federal offices the project was abandoned in 1969).

Once the researcher has assessed the impact of these extraneous variables to the best of his ability and incorporated their predicted effects into an estimate of future enrollment, the figures are then subjected to scrutiny and review by both the decision makers who must use the projection and by the community groups who represent varied and often conflicting interests. It is at this point that political considerations intrude on what had previously been a purely technical process.

Conflicts often arise among residents of areas in which new schools are proposed to be built, community groups, PTA's or home and school associations, and citizen "watch-dog" committees. Such conflicts result in political pressures being brought to bear on the School Board and administration in an attempt to alter priorities, or to expand or curtail the building program.

The crucial issue for the School District and the community has traditionally been whether the enrollment projections and the subsequent building program as finally adopted by the School Board will reflect the real needs identified through analytical research, or whether they will represent a politically expedient compromise which may leave the needs of some areas - and perhaps the needs of the City as a whole - unmet.

There is another important complicating factor which affects the enrollment projection process, particularly where extended periods of time are involved in the forecast. It has become apparent, on a national basis, that the rapidly accelerating enrollments that have been with us for many years now have leveled off. Some have attributed this to the "pill" and to improved birth control methods and the increased availability of both information and devices. Those who are familiar with cohort analysis, however, are skeptical of this interpretation. For the later group the leveling off of the rate of increase in student enrollment is seen more as a function of the number of women of child bearing age. And for this group, there is a great deal of concern about the fact that the post-war

baby boom (which extended from 1945 through about 1959) is resulting in a large increase in the age cohort of women reaching child bearing age for the first time in the 1970's. The main implication of this analysis of the situation is a resumption of high rates of increase in school enrollments. Moreover, this effect will be felt in the very near future because of the increasing emphasis being placed on preschool and early childhood education.

It is our contention that there is now a newer and greater danger in the increasing influence being accorded certain types of community "watch-dog" groups whose sole objective is to reduce spending for education as such. The net effect is to leave the needs of the entire community unmet, at least in part, independent of the relative political "clout" of different areas or population groups.

The economic factors underlying the position of these "watch-dog" groups include higher land acquisition costs as urban land becomes scarcer, the increased costs of construction due to inflation, higher interest rates, related increases in operating costs, escalating tax rates for other municipal purposes, shrinking tax ratables, loss of jobs due to the flight of businesses to the suburbs, and so forth.

Tactically, the economic "watch-dog" groups base their expenditure-reduction campaigns on four specific major issues:

1) Adoption of enrollment projection methods that result in the lowest overall estimates of space needs, and which fail to take into account differential needs from one small area to another;

2) The continued use of existing space, regardless of age, condition or fire-resistive qualities, and including full utilization as classrooms of all portables and demountables;

3) Restrictions on kindergarten and other locally funded preschool programs, primarily through narrower age criteria for eligibility; and

4) The emotionally popular theme that the community "can't afford" additional expenditures for education, particularly when it can "make do" with what is available.

Our argument is that the approach advocated by the economic "watch-dog" groups is self-defeating, and ignores the significant role that education can and must play in ameliorating urban ills. If anything, community groups of all kinds should be supporting increased expenditures for our schools from all levels of government. Yet it is time for public education to recognize that its credibility with the community has slipped tremendously and that some kind of taxpayers' revolt has gained momentum in an era of outrageous inflation and social uncertainty. No longer can the professional educator operate on the assumption that the community will accept his appraisal of its educational needs on faith, and routinely produce the revenues needed to carry out his programs. In this climate, sounder and more systematic approaches are needed, and research methodology and related management tools must become integral components of any operating educational system. If we in public education are indeed facing a skeptical and often hostile community, legislative bodies that are unwilling to take the political risks inherent in appropriating massive new amounts of funds, and "watch-dog" groups whose educationally unsound propositions are finding more responsive audiences, then we have no alternative but to strengthen our decision-making base, and substitute research methodology and management planning for the political processes that have traditionally shaped our educational programming.

Notes and References

1/ Chevan, Albert Population Projection System, Technical Report Number 3, The Penn Jersey Transportation Study, Philadelphia, Pa., 1965.

2/ About 3 percent of the school age children in the City attend other private or independent schools.

3/ Weaver, Robert C. "Class, Race and Urban Renewal" in Metropolis: Values in Conflict, C.E. Elias, James Gillies, S. Riemer, Wadsworth Publishing Co., Belmont, California, 1965.